BeAGLE Cleanup & Documentation

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Cross-section from BeAGLE different

- BeAGLE selects struck nucleon based on the n:p ratio (A-Z):Z with equal probability.
- But in principle, σ(ep) is slightly different than σ(en), especially at high x.
- This can be fixed using different event weights for nucleon==2112 and nucleon==2212 events.
- Documented this on wiki with help from Barak Schmookler.
- Also documented BeAGLE/GCF behavior w/ advice from Jackson Pybus.

e + ^{3}He → e' + p + p + X

- Recall: quick&dirty fix of BeAGLE to have a reasonable single-particle n(k)-based spectator dist. for ^{3}He with struck neutron. Usable by Alex!
- Running lots of tests to check/fix backward compatibility before releasing.
  - e+Pb and e+C events are identical to those before the change (for fixed seed).
  - e +^{3}He w/ struck proton is sick – but it was before
    - Some spectators lost – never show up with KS==1
    - Doesn't stop me from releasing, but should be fixed.
  - Will probably disallow use of INC for A=3.

$e + {}^3He \rightarrow e' + p + p + X$

- Struck neutron (Pythia subevent) has slightly too much energy in the IRF. Will be fixed in the next iteration.
- Longer term, will allow spectral function approach (Kong) + SRC (GCF-DIS and/or Kong).

Must cleanup general e+A Fermi momentum

- Changes that we made to improve the Fermi momentum distributions (vs. DPMJET) for A>4:
  - May have had a side effect.
    - Default "FERMOD" parameter was changed from 0.55 to 0.62.
    - This sets the p-scale for n(k) but it ALSO affects the depth of the mean field nuclear potential and therefore the momentum of outgoing nucleons.
  - Were not backward compatible – we should have a switch to go back to standard DPMJET for comparison.
  - So we can't quickly tell what impact this has (unless we pull out an old version of BeAGLE from git).